

IN THE CLAIMS:

Please cancel Claims 1, 8, and 16 without prejudice or disclaimer of subject matter. Please amend Claims 2, 3, 6, 7, and 9 to 15, and add new Claim 17, as shown below.

1. (Cancelled)
2. (Currently Amended) A plasma processing apparatus according to ~~claim 1~~ claim 9, wherein an interval between said plate that forms the cooling channel and said dielectric is equal to or smaller than 2 mm.
3. (Currently Amended) A plasma processing apparatus according to ~~claim 1~~ claim 9, wherein the cooling channel is supplied with coolant.
4. (Original) A plasma processing apparatus according to claim 3, wherein the coolant includes at least one of air, nitrogen, inactive gas, Fluorinert®, Galden® and Fluorine included solution.
5. (Original) A plasma processing apparatus according to claim 3, wherein the coolant includes gas, liquid or a low dielectric loss material.
6. (Currently Amended) A plasma processing apparatus according to ~~claim 1~~ claim 9, wherein the cooling channel is exhaustibly supplied with coolant.

7. (Currently Amended) A plasma processing apparatus according to ~~claim 1~~ claim 9, further comprising:

a temperature detector for measuring the temperature of or near said dielectric; and

a controller for controlling a flow rate of coolant based on the temperature detected by said temperature detector, the coolant being supplied to the cooling channel.

8. (Cancelled)

9. (Currently Amended) A plasma processing apparatus ~~according to claim 8~~, comprising:

a vacuum chamber that accommodates an object to be processed, and provides a plasma process to the object in a vacuum or reduced pressure environment;

a dielectric for transmitting microwaves to said vacuum chamber and for maintaining the vacuum or reduced environment of said vacuum chamber;

a plate that has slots for guiding the microwaves to said dielectric; and

a temperature control mechanism that has a cooling channel between said plate and said dielectric, and controls temperature of said dielectric,

wherein the cooling channel comprises a heat conductive medium, and

wherein the heat conductive medium is arranged around on the surface of said dielectric, around a peripheral portion of said dielectric.

10. (Currently Amended) A plasma processing apparatus according to ~~claim 8~~ claim 9, wherein the heat conductive medium includes silicon powder or silicon oil.

11. (Currently Amended) A plasma processing apparatus according to ~~claim 8~~ claim 9, wherein the heat conductive medium is a high dielectric loss material.

12. (Currently Amended) A plasma processing apparatus according to ~~claim 1~~ claim 9, wherein said plate is made of a material that includes at least one of aluminum, gold, silver and copper.

13. (Currently Amended) A plasma processing apparatus according to ~~claim 1~~ claim 9, wherein said dielectric is made of a material that includes at least one of alumina-ceramic, aluminum nitride and ~~quartz~~ quartz.

14. (Currently Amended) A plasma processing apparatus according to claim 3, further comprising:

a waveguide for guiding the microwaves to ~~the~~ said plate, wherein plural holes are formed in a part of said waveguide, such that the coolant is allowed to pass through the holes and such that the microwaves are prevented from transmitting through the holes; ~~said waveguide forming plural holes in place which allow the coolant to pass through the holes and prevent the microwaves from transmitting through the holes; and~~

a partition, formed on said waveguide between the ~~plate~~ part of said waveguide having the holes and a microwave source for supplying the microwaves, for preventing the coolant from moving along said waveguide to the microwave source.

15. (Currently Amended) A plasma processing apparatus according to ~~claim 3~~ claim 14, wherein said partition is made of a high dielectric loss material.

16. (Cancelled)

17. (New) A plasma processing apparatus comprising:

a vacuum chamber that accommodates an object to be processed, and provides a plasma process to the object in a vacuum or reduced pressure environment;  
a dielectric for transmitting microwaves to said vacuum chamber and for maintaining the vacuum or reduced environment of said vacuum chamber;

a plate that has slots for guiding the microwaves to said dielectric; and

a temperature control mechanism that has a cooling channel between said plate and said dielectric, and controls temperature of said dielectric, wherein the cooling channel is supplied with coolant;

a waveguide for guiding the microwaves to said plate, wherein plural holes are formed in a part of said waveguide, such that the coolant is allowed to pass through the holes and such that the microwaves are prevented from transmitting through the holes; and

a partition, formed on said waveguide between the part of said waveguide

having the holes and a microwave source for supplying the microwaves, for preventing the coolant from moving along said waveguide to the microwave source, wherein the partition is made of a high dielectric material.